

WHAT IS CLAIMED IS:

1. A method of modulating seed mass in a plant, the method comprising:  
 providing a first plant comprising a recombinant expression cassette containing an *ADC* nucleic acid linked to a plant promoter;  
 selfing the first plant or crossing the first plant with a second plant, thereby producing a plurality of seeds; and  
 selecting seed with altered mass.
2. The method of claim 1, wherein expression of the *ADC* nucleic acid inhibits expression of an endogenous *ADC* gene and the step of selecting includes the step of selecting seed with increased mass.
3. The method of claim 2, wherein the seed have increased protein content, carbohydrate content, or oil content.
4. The method of claim 2, wherein the *ADC* nucleic acid is linked to the plant promoter in the antisense orientation.
5. The method of claim 2, wherein the *ADC* nucleic acid is selected from a group consisting of Genbank accession numbers U12546, AF003094, AF003095, AF003096, AF003097, AF003098, AF003099, AF003100, AF003101, AF003102, AF003103, AF003104, and AF003105.
6. The method of claim 2, wherein the first and second plants are the same species.
7. The method of claim 2, wherein the first and second plants are members of the family Brassicaceae.
8. The method of claim 2, wherein the first and second plants are members of the family Solanaceae.

9. The method of claim 2, wherein the plant promoter is a constitutive promoter.

5 10. The method of claim 9, wherein the promoter is a CaMV 35S promoter.

11. The method of claim 2, wherein the promoter is a tissue-specific promoter.

10 12. The method of claim 11, wherein the promoter is ovule-specific.

13. A seed produced by the method of claim 2.

15 14. The method of claim 1, wherein expression of the *ADC* nucleic acid enhances expression of an endogenous *ADC* gene and the step of selecting includes the step of selecting seed with decreased mass.

20 15. The method of claim 14, wherein the *ADC* nucleic acid is selected from a group consisting of Genbank accession numbers U12546, AF003094, AF003095, AF003096, AF003097, AF003098, AF003099, AF003100, AF003101, AF003102, AF003103, AF003104, and AF003105.

25 16. The method of claim 14, wherein the first and second plants are the same species.

17. The method of claim 14, wherein the first and second plants are members of the family Brassicaceae.

30 18. The method of claim 14, wherein the first and second plants are members of the family Solanaceae.

19. The method of claim 14, wherein the plant promoter is a constitutive promoter.

5 20. The method of claim 19, wherein the promoter is a CaMV 35S promoter.

21. The method of claim 14, wherein the promoter is a tissue-specific promoter.

10 22. The method of claim 21, wherein the promoter is ovule-specific.

23. A seed produced by the method of claim 14.

15 ~~Sub B4~~  
~~Sub D2~~ 24. A seed comprising a recombinant expression cassette containing an ADC nucleic acid.

25. The seed of claim 24, which is derived from a plant that is a member of the family Brassicaceae.

20 ~~Sub B5~~ 26. The seed of claim 24, wherein the ADC nucleic acid is selected from a group consisting of Genbank accession numbers U12546, AF003094, AF003095, AF003096, AF003097, AF003098, AF003099, AF003100, AF003101, AF003102, AF003103, AF003104, and AF003105.

25 27. The seed of claim 24, wherein the ADC nucleic acid is linked to a plant promoter in an antisense orientation and the seed mass is at least about 10% greater than the average mass of seeds from the same plant variety which lack the recombinant expression cassette.

30 28. The seed of claim 27, wherein the mass is at least about 20% greater than the average mass of seeds from the same plant variety which lack the recombinant expression cassette.

29. The seed of claim 27, wherein the mass is at least about 50% greater than the average mass of seeds from the same plant variety which lack the recombinant expression cassette.

5 30. The seed of claim 27, wherein the oil content is proportionally increased.

31. The seed of claim 27, wherein the protein content is proportionally increased.

10 32. The seed of claim 24, wherein the *ADC* nucleic acid is linked to a plant promoter in the sense orientation and the seed mass is at least about 10% less than the average mass of seeds of the same plant variety which lack the recombinant expression cassette.

15 33. The seed of claim 32, which has a mass at least about 20% less than the average mass of seeds of the same plant variety which lack the recombinant expression cassette.

20 34. The seed of claim 32, which has a mass at least about 50% less than the average mass of seeds of the same plant variety which lack the recombinant expression cassette.

25 35. A transgenic plant comprising an expression cassette containing a plant promoter operably linked to a heterologous *ADC* polynucleotide.

30 36. The transgenic plant of claim 35, wherein the *ADC* polynucleotide is selected from a group consisting of Genbank accession numbers U12546, AF003094, AF003095, AF003096, AF003097, AF003098, AF003099, AF003100, AF003101, AF003102, AF003103, AF003104, and AF003105.

Sub B<sup>6</sup>  
D3

37. The transgenic plant of claim 35, wherein the heterologous *ADC* polynucleotide encodes a ADC polypeptide.

38. The transgenic plant of claim 35, wherein the heterologous *ADC* polynucleotide is linked to the promoter in an antisense orientation.

39. The transgenic plant of claim 35, which is a member of the genus *Brassica*.

40. An isolated nucleic acid molecule comprising an expression cassette containing a plant promoter operably linked to a heterologous *ADC* polynucleotide.

41. The isolated nucleic acid molecule of claim 40, wherein the *ADC* polynucleotide is selected from a group consisting of Genbank accession numbers U12546, AF003094, AF003095, AF003096, AF003097, AF003098, AF003099, AF003100, AF003101, AF003102, AF003103, AF003104, and AF003105.

42. The isolated nucleic acid of claim 40, wherein the heterologous *ADC* polynucleotide encodes a ADC polypeptide.

43. The isolated nucleic acid of claim 40, wherein the heterologous *ADC* polynucleotide is linked to the promoter in an antisense orientation.

44. The isolated nucleic acid of claim 40, which is a member of the genus *Brassica*.

Add B's